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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,913	10/23/2001	Makoto Kitabatake	10873.830US01	8598

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EXAMINER	
ABRAHAM, FETSUM	
ART UNIT	**PAPER NUMBER**
2826	

DATE MAILED: 01/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/002,913	KITABATAKE, MAKOTO	
	Examiner	Art Unit	
	Fetsum Abraham	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,7,9,10,14,15,17 and 23-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *all* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *1/7/04* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Final rejection

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

2. Claims 2,3,7,9,10,14,15,17,23-28 are rejected under 35 U.S.C. 103(a) as obvious over Ueno (5,693,569).

As for claims 2,3,9,10,23,24,26,27 the patent discloses a SIC based field effect transistor in the front page composed of source (4), source electrode (8), both elements on the first substrate surface, a drain (1) and drain electrode (9) on the second surface, a first conductivity type (n) semiconductor that includes a first conductivity type drift region (2), and

second conductivity type region (3) on the substrate, a shottky diode formed by contact between the first conductivity type semiconductor (2) and a metal electrode (21), the overall semiconductor body represented by the first conductivity type SiC substrate (1) and first conductivity type epitaxially SiC drift layer (2), and second conductivity type base layer (3).

The structure is characterized as having depletion widths from the Schottky effect and the PN junction effect between layers (2,3) as superimposed because the drift layer (2) which is common to both actions is affected by the claimed two depletion characteristics. Further, the schottky diode is included in a region for group of transistors and is

formed by contact between the drift region exposed between the transistor on the first surface side and the metal electrode.

Although the way the inherent depletion layers are not disclosed by the patent, it would have been obvious to one skilled in the art to conclude depletion width from the PN junction associated with layers (2 and 3) and that of the schottky diode since depletion is unavoidable in any PN junction that is reverse biased or in floating condition. In this case, the locations of the PN junction and the schottky diode inherently impose superimposed depletion layers similar to the claimed invention either by default or by inherence due to the discussed common layer (2) to the claimed two depletion characterists.

As for claims 9,10 in specifics, all elements including gate insulated transistor in the claim are present in the prior art including a space in the body for multiple transistor formation. The fact that the structure doesn't have definite side ends means that the layers are continuous for more devices to be formed. Besides, forming multiple devices on a given body is normal practice in IC fabrication in order to save material, processing time, and processing steps. In other words, the claimed multiple transistors are duplicates of the one transistor in the prior art.

As for claims 15,17, conducting channel is located in the exact claimed position of the prior art in respect to the other analogous elements of the claimed device. That channel is activated into on condition upon application of gate voltage. The surface of the recess where the gate is formed is also covered by the gate insulation (5).

As for claims 14,25,28, the SIC material in the prior art includes all compositions and types of SIC without discriminating any one of them.

Please pay attention to the prior art structure in the front page and the claimed invention in figure 7. They are almost identical. In light of such structural similarity, the position of the examiner is that the depletion characteristics in the claims is inherent to the prior art unless proven otherwise by applicant.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Fetsum Abraham at telephone number (703) 305,3793, or by E-mail at ***fetsum.abraham@uspto.gov.***

Any inquiry of a general nature or relating to the status of this application should be directed to the ***SPE of AU***:2826 at (703)308-6601, or the ***Group receptionist*** at (703) 308-0956.

Fetsum Abraham/1//7///04